

CLAIMS

1. Coated strip product comprising a steel strip material (2), **characterized in that** said strip material has a coating (3; 6; 8) comprising at least one electrically insulating layer of zirconia in direct contact with the steel strip or in direct contact with an essentially metallic bond-coat which in turn is in direct contact with the steel strip.

5           2. Coated strip product according to claim 1, **characterized in that** said coating and strip material have a thermal expansion mismatch of less than  $\pm 25\%$  in the  
10 temperature range up to 1000 °C, where the thermal expansion mismatch is defined as:

$$(TEC_{ss} - TEC_{ox})/TEC_{ss}$$

15           where the  $TEC_{ss}$  is the thermal expansion of said strip material and  $TEC_{ox}$  is the thermal expansion of said zirconia coating.

20           3. Coated strip product according to claim 1, **characterized in that** the strip material has a surface roughness of  $R_a < 0.2 \mu m$ .

25           4. Coated strip product according to claim 1, **characterized in that** the strip material has a thickness of 5 to 300  $\mu m$ , preferably 10 to 100  $\mu m$ .

5. Coated strip product according to claim 1, **characterized in that** a ferritic chromium strip steel material is used as the metallic strip material.

25           6. Coated strip product according to claim 5, characterized in that said ferritic chromium strip steel material has a chromium content of at least 10% b.w., suitably at least 14% b.w., and preferably in the range 16 - 25% b.w.

7. Coated strip product according to any of claim 1, **characterized in that** the strip material is coated with at least one zirconia layer (3; 6; 8) on either side of the metallic strip material.

5        8. Coated strip product according to any of claim 1, **characterized in that** at least one additional layer of zirconia is deposited on top of the at least one layer of zirconia which is in direct contact with the steel strip or in direct contact with a metallic bond-coat which in turn is in direct contact with the steel strip.

10        9. Coated strip product according to any of claim 1, **characterized in that** the at least one layer of zirconia is stabilized zirconia, preferably yttrium stabilized zirconia (YSZ) with a percentage of  $\text{Y}_2\text{O}_3$  in the range from 0 - 25% b.w. of said layer, suitably 3 - 20% b.w., preferably 5 –15% b.w.

15        10. Coated strip product according to claim 1, **characterized in that** the thickness of the at least one zirconia layer is between 0,1 and 20  $\mu\text{m}$ , preferably between 0,5 and 5  $\mu\text{m}$ .

20        11. Coated strip product according to claim 1, **characterized in that** between the zirconia layer and the metallic strip material a metallic bond-coat is deposited, preferably a bond-coat of a metal such as Ti, Zr, Ni or Cr, to enhance the adhesion of the zirconia layer to the substrate.

25        12. Coated strip product according to any of the preceding claims, **characterized in that** on top of the electrically insulating stabilized zirconia layer or layers a conducting metal layer is deposited, the metal layer consisting preferably of one of the following metals: aluminum, molybdenum, nickel, cobalt, copper, silver, gold and platinum, most preferably aluminum, molybdenum, silver or copper.

30        13. Coated strip product according to claim 12, **characterized in that** the metal top layer has a thickness of between 0,01 and 5  $\mu\text{m}$ .

14. Coated strip product according to claim 1 **characterized in that** the electrically insulating layer(s) is/are deposited by any known deposition technique, including different spray techniques such as HVOF, plasma spraying, as well as vapor deposition techniques such as Chemical Vapor Deposition (CVD), Physical Vapor Deposition (PVD), dipping techniques, sol-gel techniques, preferably PVD in a roll-to-roll electron beam (EB) evaporation process.

15. Substrate material for the production of flexible thin film products such as flexible Cu(In,Ga)Se<sub>2</sub> (CIGS) solar cells and solid state thin film batteries **characterized in that** it essentially consists of a coated product according to any of the preceding claims.